AC-V60A/V65A

SERVICE MANUAL

US Model
Canadian Model
AC-V65A
AEP Model
UK Model
E Model
AUS Model
AC-V60A/V65A

Photo: AC-V65A

SPECIFICATIONS

Power requirements	110—240 V AC*, 50/60 Hz
Power consumption	20W
Output voltage	DC OUT: 7.5 V, 1.6 A in operating mode Battery charge terminal: 10 V, 1.3 A in charge mode
RFU DC OUT***	Special minijack, 5V DC
Output connector (Video and Audio)	
Video output***	Phono jack, 1 Vp-p, 75Ω unbalanced, sync negative
Audio output***	**Phono jack, − 7.5 dBs** Output impedance: less than 1 kΩ
Application	**Sony battery pack NP-55, NP-66 (AC-V60A), NP-66H, NP-77, NP-77H**
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to 60°C (−4°F to 140°F)
Dimensions	Approx. 170×41.6×82 mm (w/h/d) ($6\frac{3}{4}\times1\frac{11}{16}\times3\frac{1}{4}$ inches) including projecting parts and controls
Weight	Approx. 570 g (20 oz)
Supplied accessory	**AC plug adaptor (AC-V65A ONLY)****

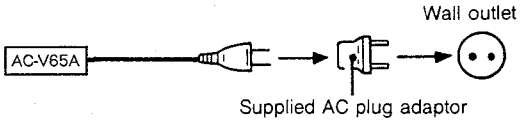
Design and specifications are subject to change without notice.

* Canadian Standard Association (CSA) certifies 120 V AC only.

** An AC plug adaptor is not supplied with the Canadian, AEP, UK and AUS models.

*** The Specifications are depend on the equipment which is connected to this AC power adaptor.

Use the supplied AC plug adaptor, if necessary, depending on the design of the wall outlet.



MICROFILM

AC POWER ADAPTOR

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

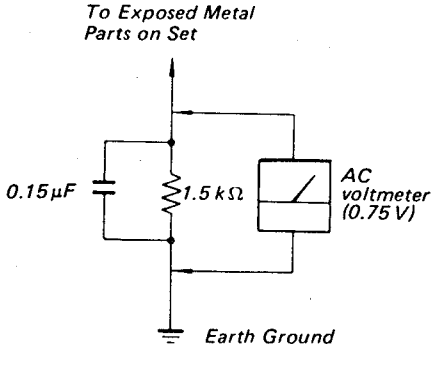


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

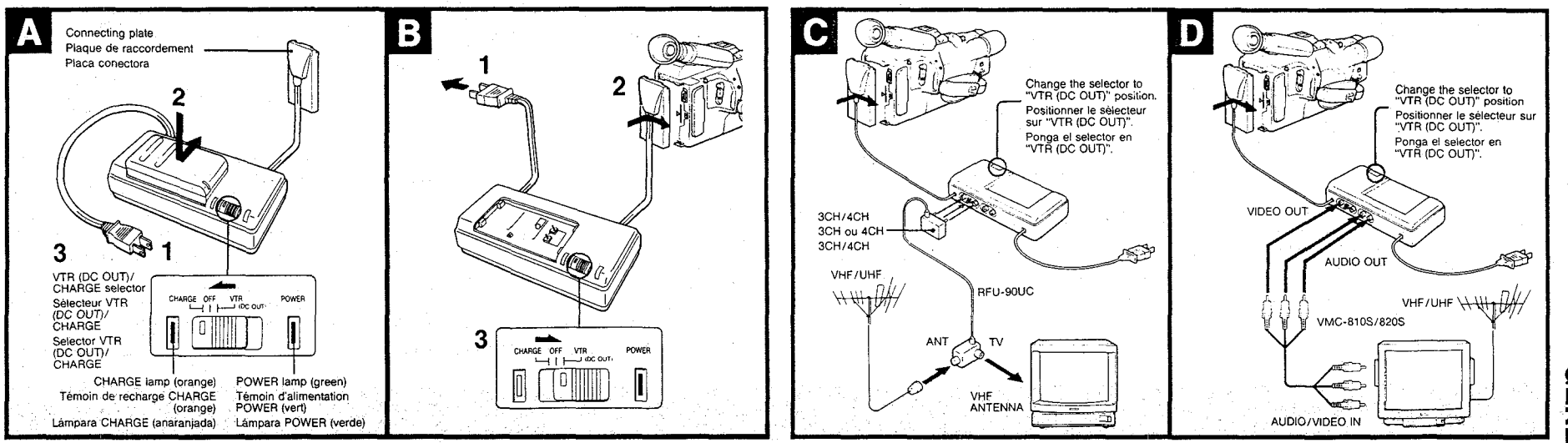
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

To Charge the Battery Pack
Recharge de la batterie rechargeable
Para cargar una batería

To Operate Video Equipment
Fonctionnement de l'équipement video
Para alimentar un equipo de vídeo

Connection for Playback
Connexions pour la lecture
Conexión para reproducción



English

INFORMATION — For the Customers in U.S.A.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

For the Customers in Canada

THIS APPARATUS COMPLIES WITH THE CLASS B LIMITS FOR RADIO NOISE EMISSIONS SET OUT IN RADIO INTERFERENCE REGULATIONS.

This section is extracted from instruction manual. (AC-V65A)

AC-V60A/V65A

The AC-V65A AC power adaptor can be used as follows:
- to charge an NP-55, NP-66H, NP-77 or NP-77H battery pack
- to supply power to the 8 mm video equipment

The AC-V65A comes in two models, differentiated by the shape of the AC power cord plug.

	Shape
Model for USA, Canada	Polarized
Model for other countries	Nonpolarized

The AC-V65A supplies power to a Sony 8 mm video camera recorder or other DC operated Sony 8 mm video equipment.

CAUTION FOR THE CUSTOMERS IN USA AND CANADA
TO PREVENT ELECTRIC SHOCK, DO NOT USE THE POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

Note on Use

Charging
- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.**
- Charge the battery on a flat place without vibration.
- The battery will get hot during charging. But it is normal.

Charging temperature
The temperature range for charging is 5°C to 35°C (41°F to 95°F).
However, to provide maximum battery efficiency, the recommended temperature range when charging is 10°C to 30°C (50°F to 86°F).

Others
- The model for USA or Canada: One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if it has been dropped or damaged.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If it does, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- While the unit is in use, it gets hot. But this is normal.
- Do not place the unit in locations where it is;
  — Extremely hot or cold
  — Dustry or dirty
  — Very humid

To Charge the Battery Pack See illustration **A** (page 3).

1 **Connect the power cord to a wall outlet.**
2 **Install the battery pack.**
Align the right side of the battery pack with the line on the AC power adaptor, then while pressing the battery pack, slide the battery pack in the direction of the arrow.
3 **Change the selector to "CHARGE" position.**

The POWER lamp (green) and the CHARGE lamp (orange) will light up. The charging will begin.

When the charging is completed, the CHARGE lamp goes out. Set the VTR (DC OUT)/CHARGE selector to OFF. The POWER lamp goes out. Then unplug the unit from the wall outlet.

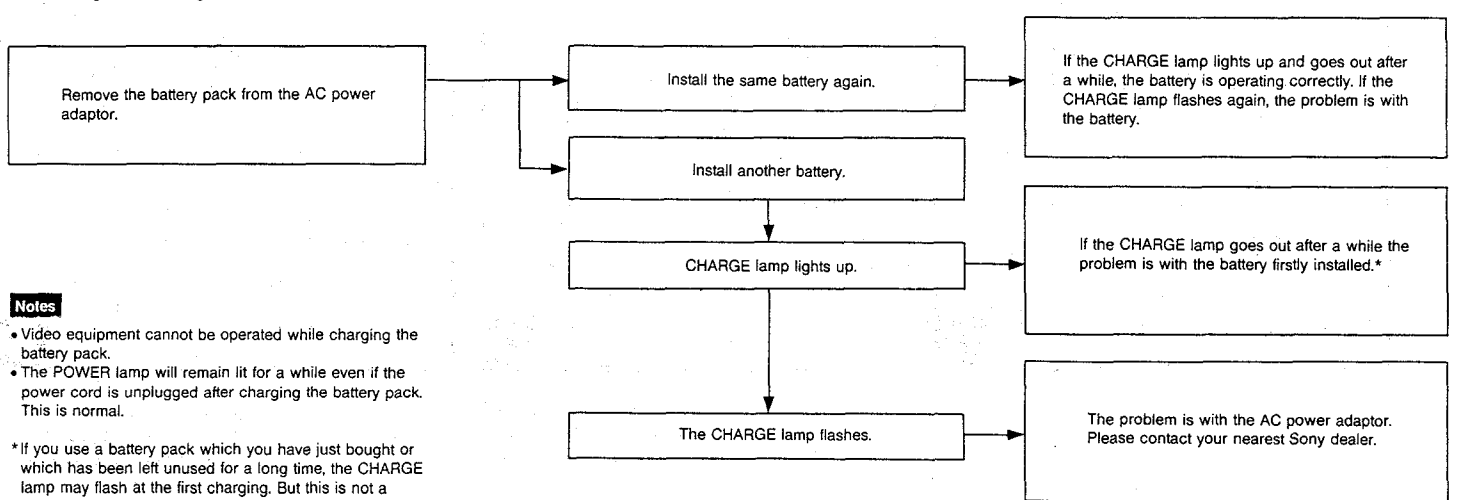
To stop charging
Remove the battery pack. Then set the VTR (DC OUT)/CHARGE selector to OFF.

Charging time

Model	Charging time
NP-77H	about 2 hours 20 minutes
NP-77	about 2 hours
NP-66H	about 1 hour 40 minutes
NP-55	about 1 hour

When the CHARGE Lamp Flashes

Check through the following chart.

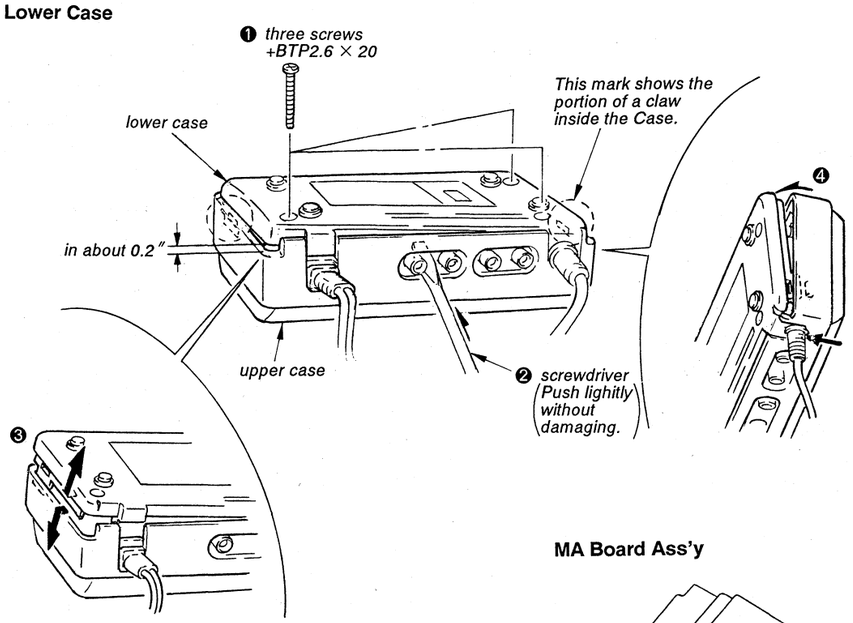

Remove the battery pack from the AC power adaptor.
Install the same battery again.
If the CHARGE lamp lights up and goes out after a while, the battery is operating correctly. If the CHARGE lamp flashes again, the problem is with the battery.
Install another battery.
CHARGE lamp lights up.
If the CHARGE lamp goes out after a while the problem is with the battery firstly installed.*
The CHARGE lamp flashes.
The problem is with the AC power adaptor. Please contact your nearest Sony dealer.

Notes
- Video equipment cannot be operated while charging the battery pack.
- The POWER lamp will remain lit for a while even if the power cord is unplugged after charging the battery pack. This is normal.

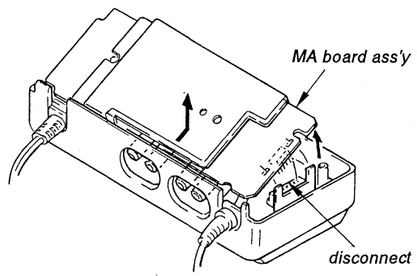
*If you use a battery pack which you have just bought or which has been left unused for a long time, the CHARGE lamp may flash at the first charging. But this is not a problem. Continue to charge with the same battery pack.

SECTION 2
DISASSEMBLY

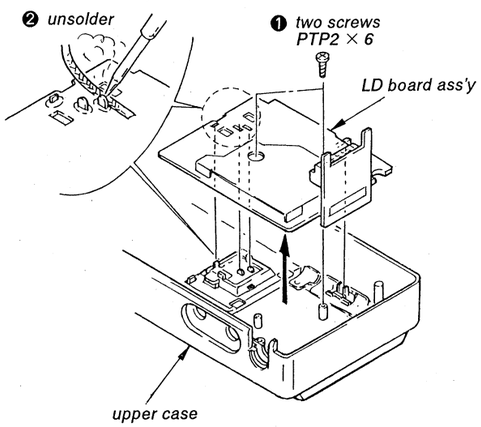
Lower Case



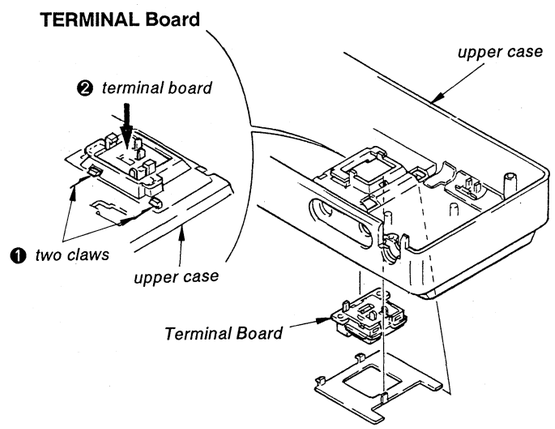
MA Board Ass'y



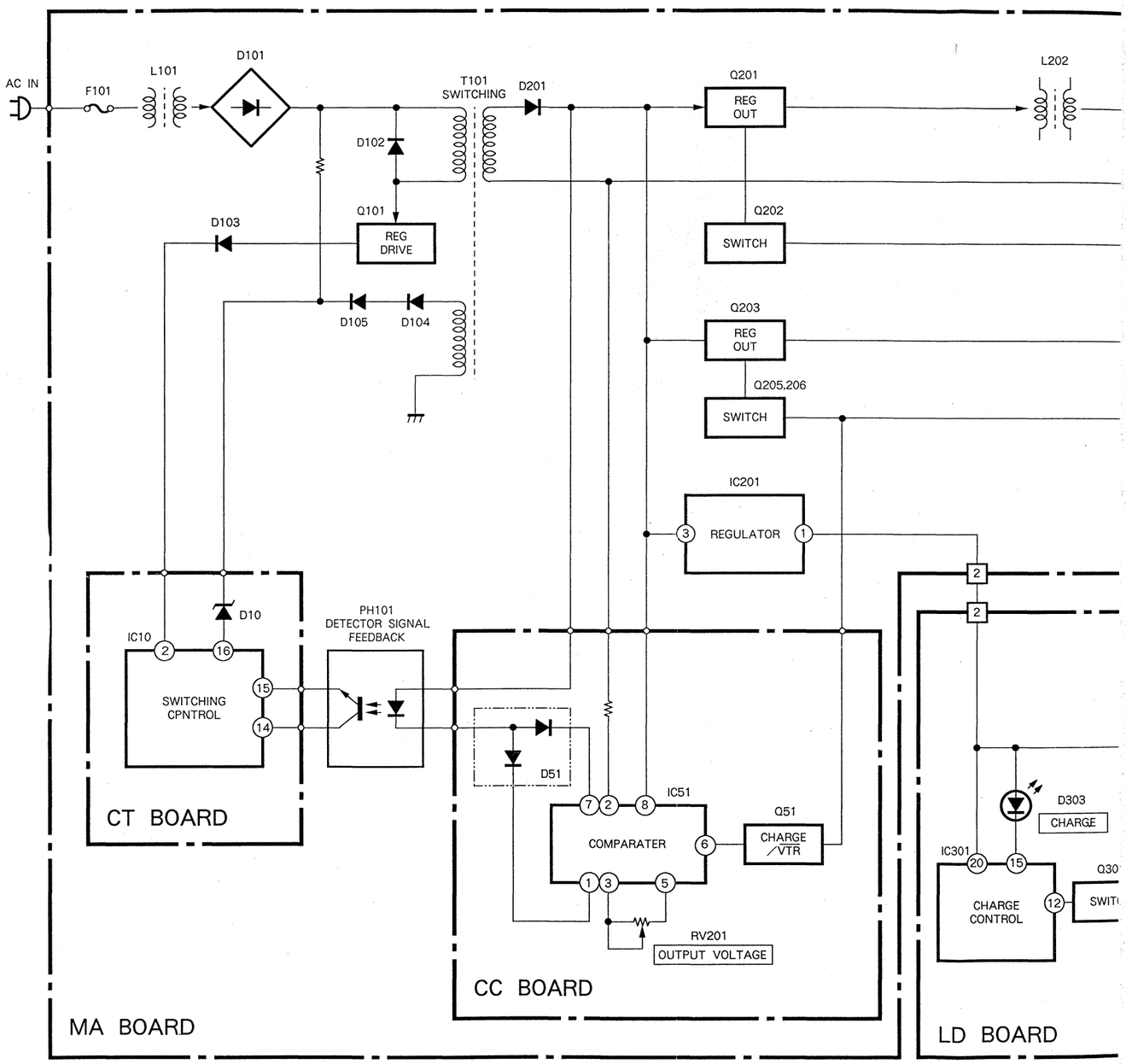
LD Board Ass'y



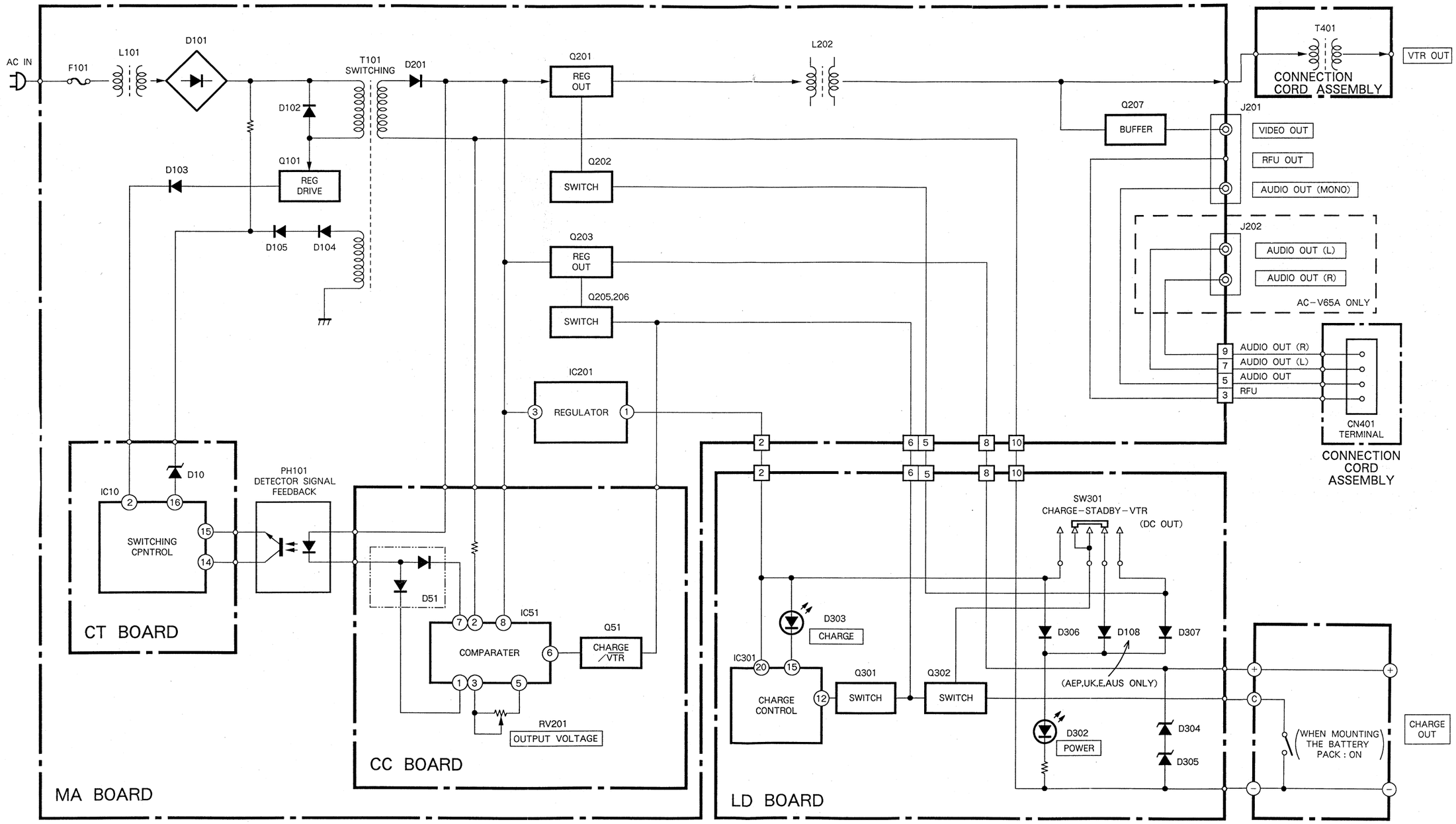
TERMINAL Board



SECTION 3
BLOCK DIAGRAM



SECTION 3
BLOCK DIAGRAM



board ass'y

disconnect

upper case

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

4-1. PRINTED WIRING BOARD

Note:

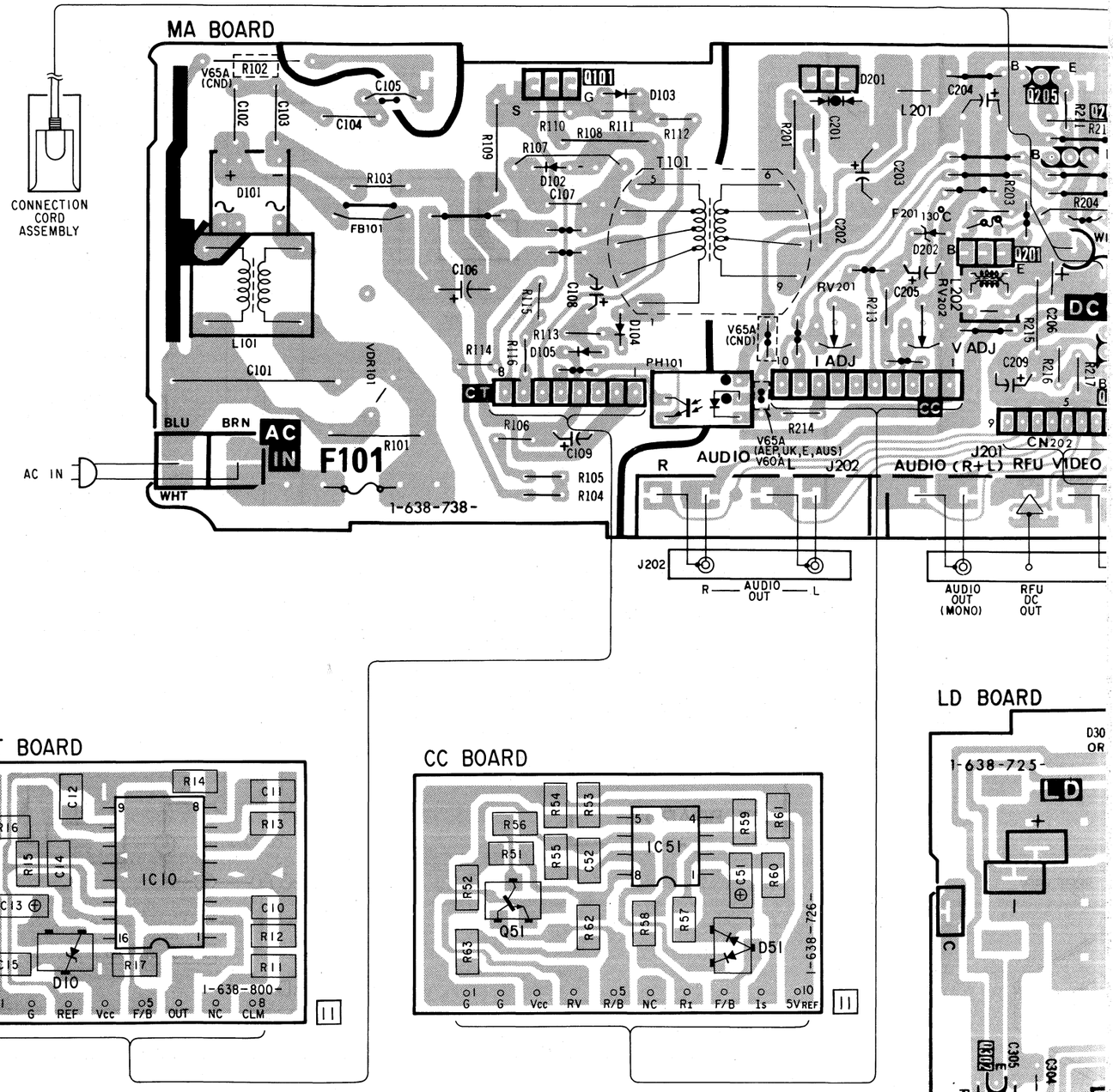
- ○——— : indicates a lead wire mounted on the component side.
- ▒▒▒ : conductor side.

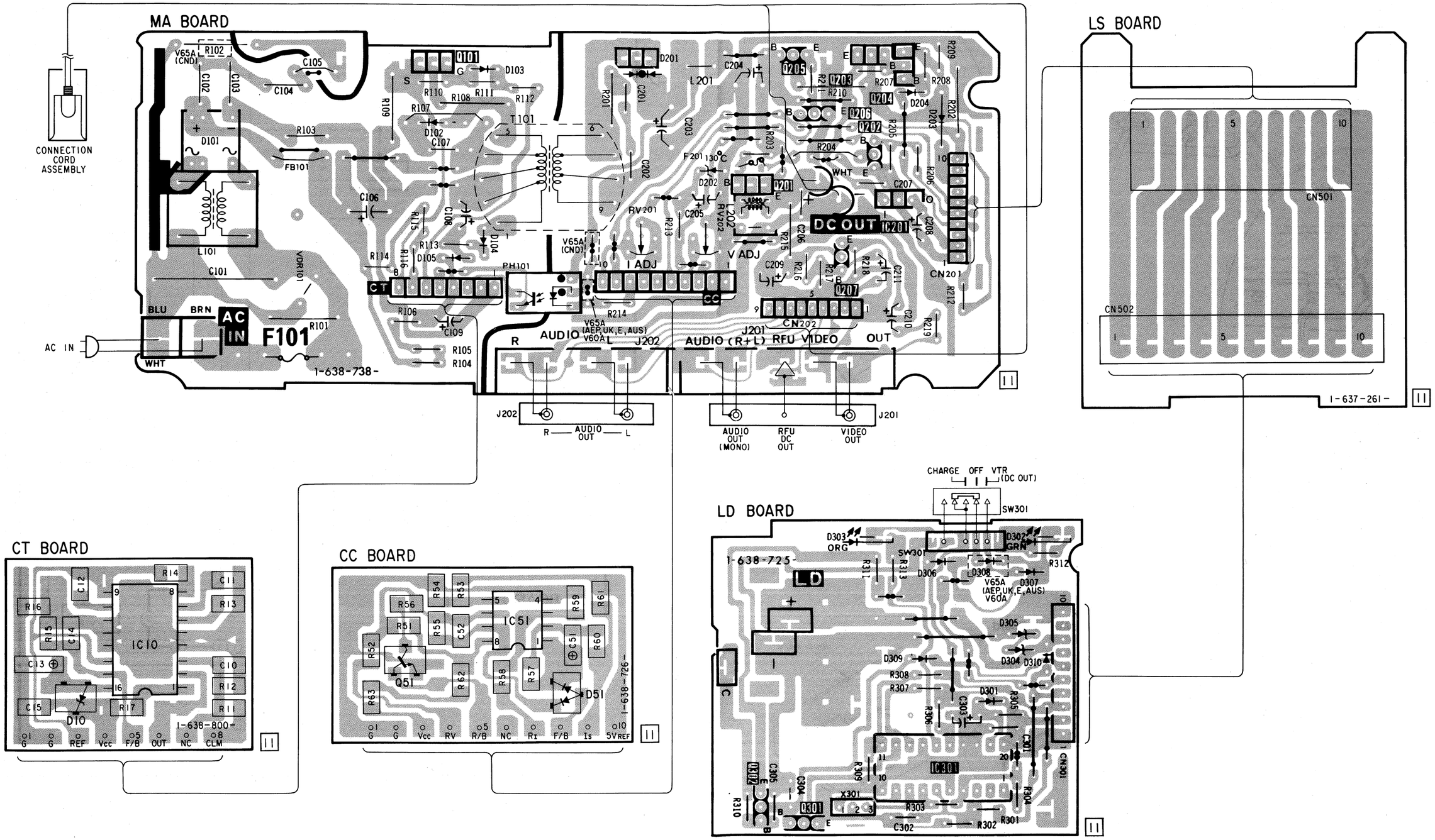
Note on Schematic Diagram:

- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊣▭⊢ : nonflammable resistor.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ▬ : B + bus.
- Voltages are dc between measurement points and ground unless otherwise noted.
- Power voltages are measured in Stand by mode.
- Reading are taken with a digital multimeter (DC10MΩ). Voltage variations may be noted due to normal production tolerances.
- ⇨ : IN/OUT direction of B + , B− bus.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.




MA BOARD
CONNECTION CORD ASSEMBLY
AC IN
BLU
BRN
WHT
AC IN
F101
1-638-738-
V65A (CND)
R102
C105
C102
C103
C104
Q101
D103
R110
R108
R111
R112
R107
D102
C107
T101
R109
R103
FB101
D101
L101
C106
C108
D104
R115
R113
R116
D105
R114
C101
VDR101
R101
PH101
RV201
I ADJ
V ADJ
R213
C205
R214
V65A (AEP,UK,E,AUS) V60A
R106
C109
R105
R104
R
AUDIO
L
J202
J201
AUDIO (R+L)
RFU
VIDEO
OUT
D201
C201
C202
C203
L201
C204
Q205
Q203
Q204
Q206
Q202
Q201
R201
R203
R204
R205
R207
R208
R209
R210
D204
D203
R202
F201 130°C
D202
L202
RV202
WHT
C207
C208
DC OUT
IC201
C206
R215
C209
R216
R217
R218
C211
C210
R219
R212
CN201
Q207
CN202
CN502
CN501
LS BOARD
1-637-261-
J202
R — AUDIO OUT — L
J201
AUDIO OUT (MONO)
RFU DC OUT
VIDEO OUT
CHARGE OFF VTR (DC OUT)
SW301
LD BOARD
1-638-725-
D303 ORG
D302 GRN
SW301
R311
R313
D306
D308
V65A (AEP,UK,E,AUS) V60A
D307
R312
LD
D305
D309
D304
D310
R308
R307
D301
R305
C303
R306
C301
CN301
IC301
C305
C304
R309
X301
R304
Q301
R303
R310
C302
R302
R301
CT BOARD
IC10
C12
C11
R14
R16
R15
C14
R13
C13
C10
R12
C15
D10
R17
R11
1-638-800-
G G REF Vcc F/B OUT NC CLM
CC BOARD
IC51
R56
R54
R53
R55
C52
R59
R61
R51
R52
Q51
R62
R58
R57
C51
R60
D51
R63
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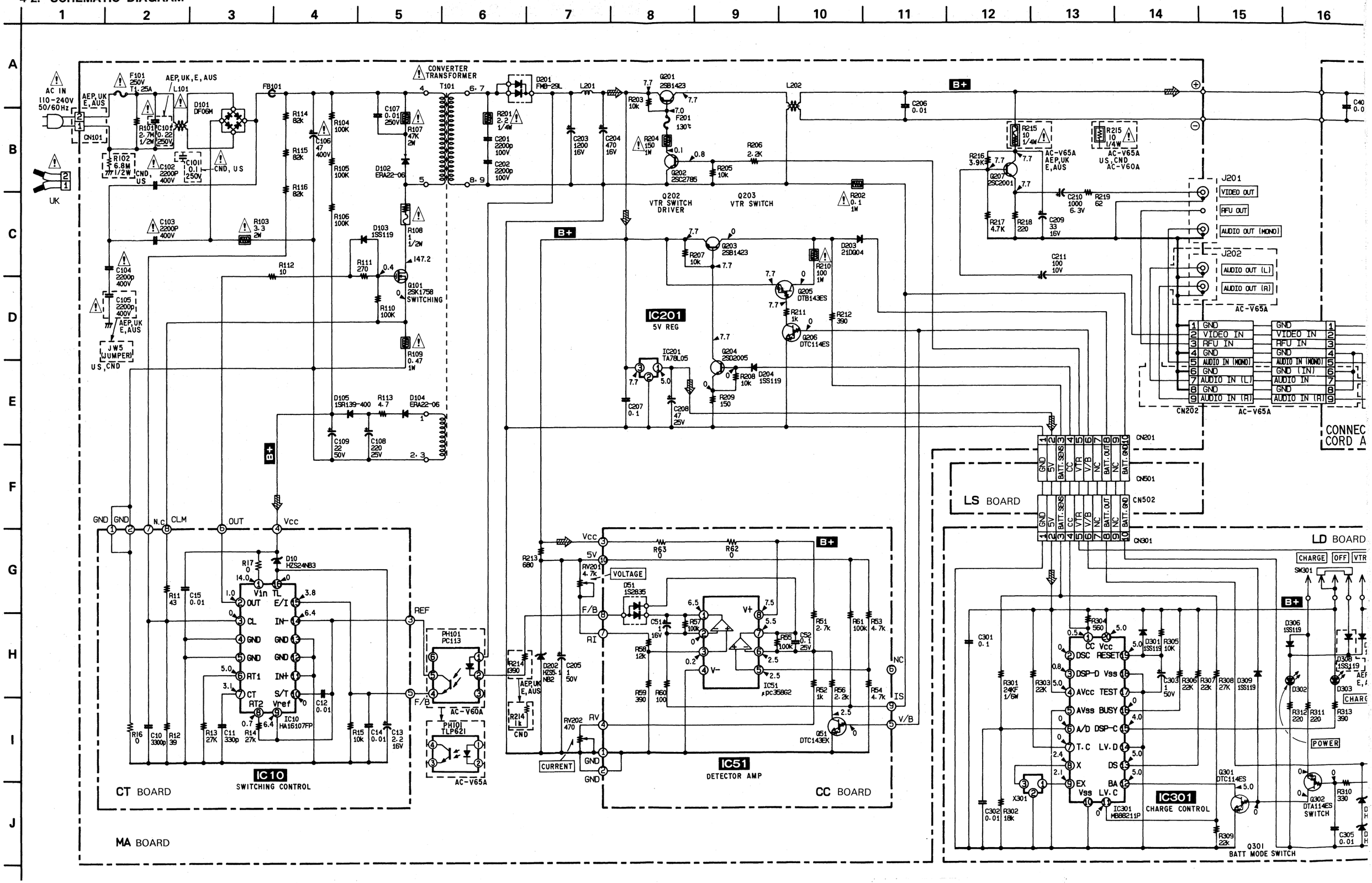
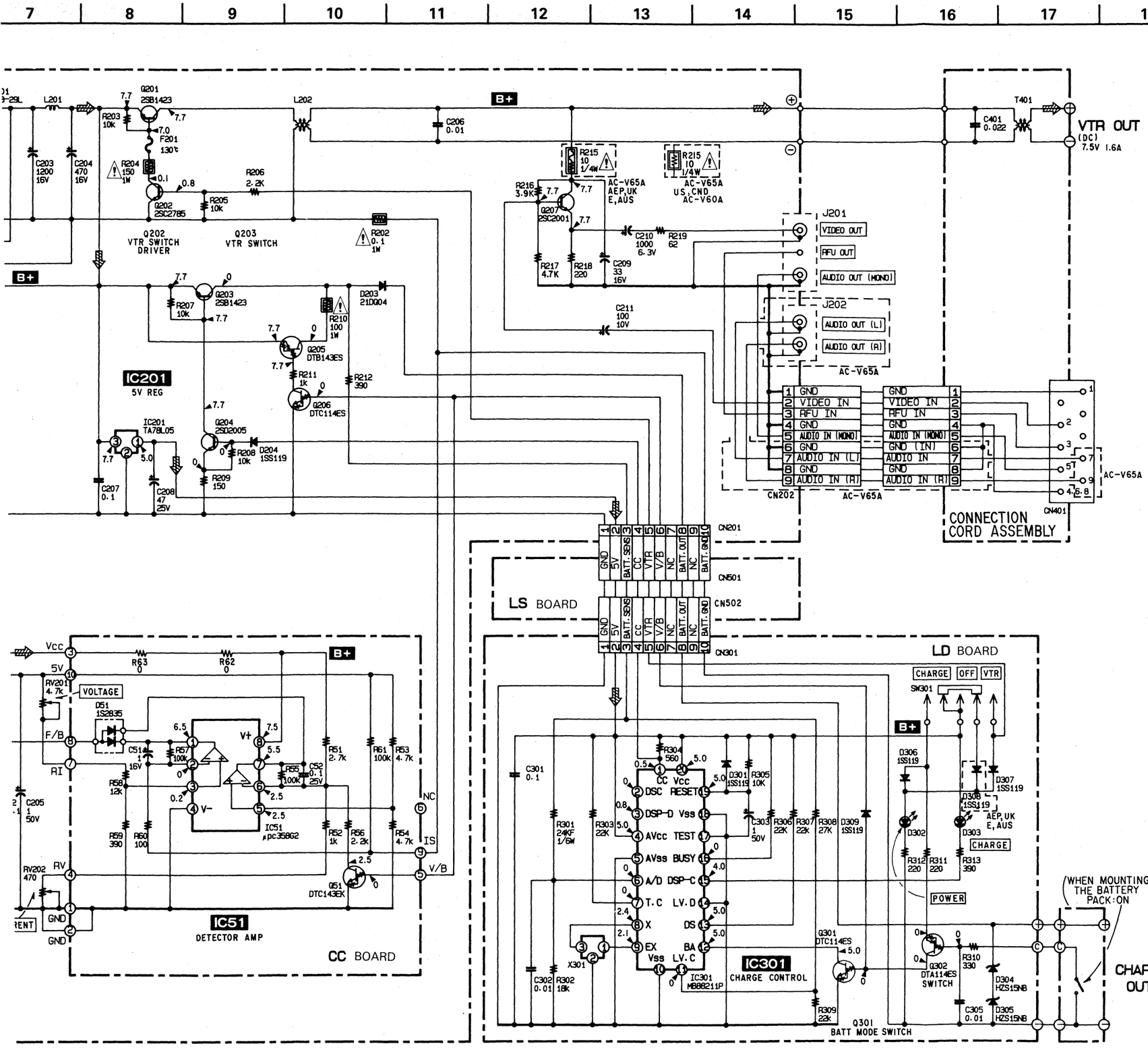
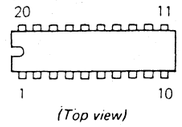
G G Vcc RV R/B NC RI F/B Is 5VREF


AC IN 110-240V 50/60Hz
UK
AEP, UK E, AUS
CN101
F101 250V T1.25A
AEP, UK, E, AUS
L101
D101 DF06M
FB101
R101 2.7M 1/2W
C101 0.22 250V
R102 6.8M 1/2W
C102 2200P 400V
CND, US
C103 2200P 400V
R103 3.3 2W
C104 2200p 400V
C105 2200p 400V
AEP, UK E, AUS
JW5 JUMPER
US, CND
R114 82k
R115 82k
R116 82k
C106 47 400V
R104 100K
R105 100K
R106 100K
C107 0.01 250V
R107 47K 2W
D102 ERA22-06
CONVERTER TRANSFORMER
T101
D201 FMB-29L
R201 2.2 1/4W
C201 2200p 100V
C202 2200p 100V
L201
C203 1200 16V
C204 470 16V
D103 1SS119
R108 1 1/2W
R111 270
R112 10
Q101 2SK1758 SWITCHING
R110 100K
R109 0.47 1W
D105 1SR139-400
R113 4.7
D104 ERA22-06
C109 22 50V
C108 220 25V
B+
GND GND N.C CLM OUT Vcc
R17 0
D10 HZS24NB3
R11 43
C15 0.01
Vin TL OUT E/I IN- CL GND GND IN+ RT1 CT S/T RT2 Vref
IC10 HA16107FP
SWITCHING CONTROL
R16 0
C10 3300p
R12 39
R13 27K
C11 330p
R14 27K
C12 0.01
R15 10K
C14 0.01
C13 2.2 16V
CT BOARD
REF
F/B
PH101 PC113
AC-V60A
PH101 TLP621
AC-V65A
MA BOARD
Q201 2SB1423
R203 10k
F201 130℃
R204 150 1W
Q202 2SC2785
Q202 VTR SWITCH DRIVER
Q203 VTR SWITCH
R205 10k
R206 2.2K
L202
C206 0.01
R202 0.1 1W
R207 10K
Q203 2SB1423
R210 100 1W
Q205 DTB143ES
R211 1k
R212 390
Q206 DTC114ES
D203 21D004
IC201 5V REG
IC201 TA78L05
C207 0.1
C208 47 25V
Q204 2SD2005
D204 1SS119
R208 10K
R209 150
C211 100 10V
R215 10 1/4W
AC-V65A AEP, UK E, AUS
R215 10 1/4W
AC-V65A US, CND AC-V60A
R216 3.9K
Q207 2SC2001
C210 1000 6.3V
R219 62
R217 4.7K
R218 220
C209 33 16V
J201
VIDEO OUT
RFU OUT
AUDIO OUT (MONO)
J202
AUDIO OUT (L)
AUDIO OUT (R)
AC-V65A
CN202
1 GND
2 VIDEO IN
3 RFU IN
4 GND
5 AUDIO IN (MONO)
6 GND (IN)
7 AUDIO IN (L)
8 GND
9 AUDIO IN (R)
GND
VIDEO IN
RFU IN
GND
AUDIO IN (MONO)
GND (IN)
AUDIO IN
GND
AUDIO IN (R)
CONNEC CORD A
CN201
GND 5V BATT. SENS CC VTR V/B NC BATT. OUT NC BATT. GND
CN501
CN502
LS BOARD
CN301
LD BOARD
CHARGE OFF VTR
SW301
B+
D306 1SS119
D308 1SS119
D302
D303
R312 220
R311 220
R313 390
POWER
C301 0.1
R304 560
D301 1SS119
R305 10K
R301 24KF 1/6W
R303 22K
R306 22K
R307 22K
R308 27K
D309 1SS119
C303 1 50V
CC Vcc
DSC RESET
DSP-D Vss
AVcc TEST
AVss BUSY
A/D DSP-C
T.C LV.D
X DS
EX BA
Vss LV.C
X301
C302 0.01
R302 18K
IC301 MB88211P
CHARGE CONTROL
Q301 DTC114ES
R309 22K
Q302 DTA114ES SWITCH
R310 330
C305 0.01
Q301 BATT MODE SWITCH
Vcc
5V
F/B
RI
GND
GND
R213 680
RV201 4.7k
VOLTAGE
R63 0
R62 0
D51 1S2835
C51 1 16V
R57 100k
R58 12k
R59 390
R60 100
V+
V-
IC51 μpc358G2
R65 100k
C52 0.1 25V
R51 2.7k
R52 1k
R56 2.2k
R61 100k
R53 4.7k
R54 4.7k
Q51 DTC143EK
NC
IS
V/B
R214 390
AEP, UK E, AUS
R214 1k
CND
D202 HZS5.1 NB2
C205 1 50V
RV202 470
CURRENT
IC51
DETECTOR AMP
CC BOARD

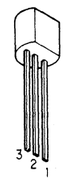


4-3. SEMICONDUCTORS

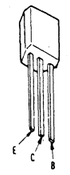
HB88211P-171N



RC78L05A

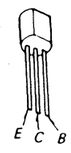


DTA114ES
DTB143ES
DTC114ES



2SB1127
2SB1423-R

2SC2001-LK



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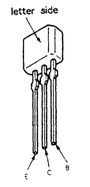
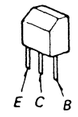
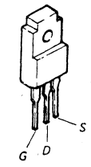
2SC2785F-HFE



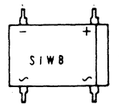
2SD773
2SD2005



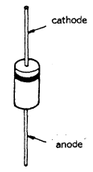
2SK1708
2SK1758



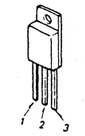
DF06M
S1WB60B



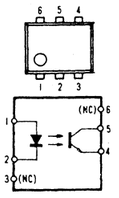
ERA22-08
ERA83-004
HZS5.1NB2



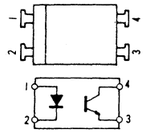
FMB-29L
F10P10Q
YG802C09



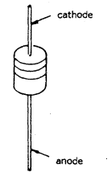
PC113A
PS2652-P



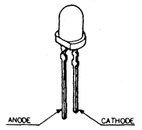
PS2501L1-DA
TLP621



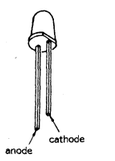
RD5.1ES-B2
RD5.1ES-B1
1SR139-400
1SS119
1SS133



SLR-34DC3



SLR-34MC3



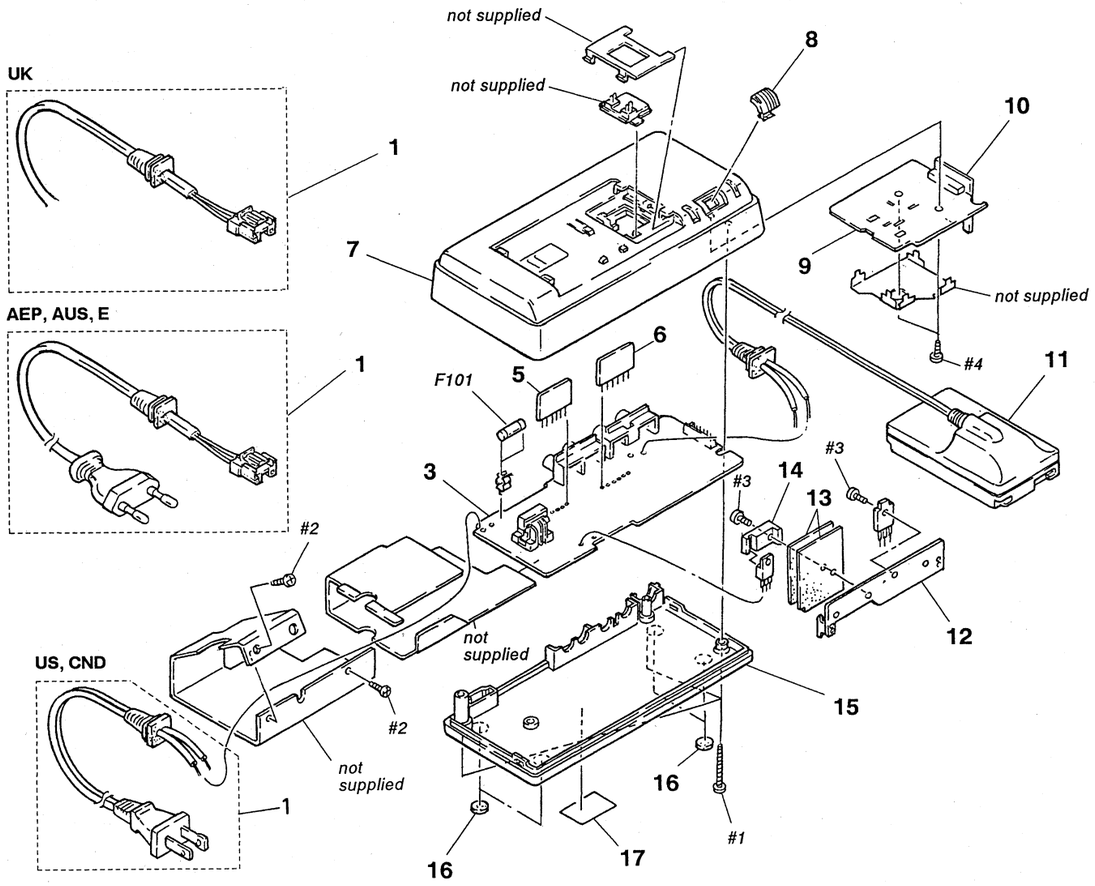
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.



Ref.No.	Part No.	Description	Remark
1	⚠ 1-559-481-11	CORD, POWER	(US, CND)
1	⚠ 1-590-131-11	CORD, POWER	(AEP, E)
1	⚠ 1-590-132-11	CORD, POWER	(UK)
1	⚠ 1-590-133-11	CORD, POWER	(AUS)
3	A-4920-393-A	MA BOARD, COMPLETE	(US, CND)
3	A-4925-549-A	MA BOARD, COMPLETE	(AC-V60A: AEP, AUS, E)
3	A-4925-549-B	MA BOARD, COMPLETE	(AC-V60A: UK)
3	A-4925-558-A	MA BOARD, COMPLETE	(AC-V65A: AEP, UK, AUS, E)
5	A-4925-546-A	CT BOARD, COMPLETE	(AC-V65A, AC-V60A: AEP, E, AUS)
5	A-4925-546-B	CT BOARD, COMPLETE	(AC-V65A: UK)
6	A-4925-547-A	CC BOARD, COMPLETE	(AC-V65A, AC-V60A: AEP, E, AUS)
6	A-4925-547-B	CC BOARD, COMPLETE	(AC-V65A: UK)
7	A-4921-528-A	CASE ASSY, UPPER	(AC-V60A: AEP, E, AUS)
7	A-4921-528-B	CASE ASSY, UPPER	(AC-V65A: UK)
7	A-4921-555-A	CASE ASSY, UPPER	(AC-V65A: AEP, UK, E, AUS)
7	A-4921-524-A	CASE ASSY, UPPER	(US, CND)
8	2-183-117-01	KNOB	
9	A-4925-544-A	LD BOARD, COMPLETE	(US, CND)
9	* A-4925-548-A	LD BOARD, COMPLETE	(EXCEPT FOR AC-V60A: UK)
9	* A-4925-548-B	LD BOARD, COMPLETE	(AC-V60A: : UK)
10	* A-4925-500-A	LS BOARD, COMPLETE	(AC-V65A, AC-V60A: AEP, E, AUS)
10	A-4925-500-B	LS BOARD, COMPLETE	(AC-V60A: UK)
11	A-4921-526-A	CORD ASSY, CONNECTION	(AC-V65A)
11	A-4921-530-A	CORD ASSY, CONNECTION	(AC-V60A: AEP, E, AUS)
11	A-4921-530-B	CORD ASSY, CONNECTION	(AC-V60A: UK)
12	* 2-434-654-01	HEAT SINK (HS-ACC06)	
13	2-431-915-01	RUBBER (ST-ACC06), RADIATION	
14	2-431-779-01	INSULATOR (TP-CR77)	
15	X-2395-923-1	CASE (KSP-ACC06-B)	
16	2-183-127-01	FOOT, RUBBER	
17	* 2-439-478-01	LABEL, MODEL NUMBER	(AC-V65A: E)
17	* 2-439-479-01	LABEL, MODEL NUMBER	(AC-V65A: AUS)
17	* 2-439-480-01	LABEL, MODEL NUMBER	(AC-V60A: E)
17	* 2-439-481-01	LABEL, MODEL NUMBER	(AC-V60A: AUS)
17	* 2-439-442-01	LABEL, MODEL NUMBER	(US)
17	* 2-439-443-01	LABEL, MODEL NUMBER	(CND)
17	* 2-439-444-01	LABEL, MODEL NUMBER	(AC-V65A: AEP)
17	* 2-439-445-01	LABEL, MODEL NUMBER	(AC-V65A: UK)
17	* 2-439-448-01	LABEL, MODEL NUMBER	(AC-V60A: AEP)
17	* 2-439-449-01	LABEL, MODEL NUMBER	(AC-V60A: UK)
F101	1-532-823-11	FUSE, GLASS TUBE (250V 1.25A)	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

When including parts by reference number, please include the board name.

Ref.No.	Part No.	Description			Remark
	* A-4925-544-A	LD BOARD, COMPLETE			
		**********			
		〈 CAPACITOR 〉			
C301	1-136-165-00	FILM	0.1uF	5% 50V	
C302	1-136-153-00	FILM	0.01uF	5% 50V	
C303	1-126-160-11	ELECT	1uF	20% 50V	
C305	1-136-153-00	FILM	0.01uF	5% 50V	
		〈 CONNECTOR 〉			
CN301	1-580-383-11	PIN, CONNECTOR 10P			
		〈 DIODE 〉			
D301	8-719-911-19	DIODE 1SS119			
D302	8-719-940-82	DIODE SLR-34MC3 (POWER)			
D303	8-719-946-30	DIODE SLR-34DC3 (CHARGE)			
D304	8-719-110-41	DIODE RD15ES-B2			
D305	8-719-110-41	DIODE RD15ES-B2			
D306	8-719-911-19	DIODE 1SS119			
D307	8-719-911-19	DIODE 1SS119			
D308	8-719-911-19	DIODE 1SS119			(AEP, UK, E, AUS)
D309	8-719-911-19	DIODE 1SS119			
		〈 IC 〉			
IC301	8-759-512-82	IC MB88211P-171N			
		〈 TRANSISTOR 〉			
Q301	8-729-900-80	TRANSISTOR	DTC114ES		
Q302	8-729-900-61	TRANSISTOR	DTA114ES		
		〈 RESISTOR 〉			
R301	1-215-454-00	METAL	24K	1% 1/6W	
R302	1-249-432-11	CARBON	18K	5% 1/4W	
R303	1-249-433-11	CARBON	22K	5% 1/4W	
R304	1-249-414-11	CARBON	560	5% 1/4W	
R305	1-249-429-11	CARBON	10K	5% 1/4W	
R306	1-249-433-11	CARBON	22K	5% 1/4W	
R307	1-249-433-11	CARBON	22K	5% 1/4W	
R308	1-249-434-11	CARBON	27K	5% 1/4W	
R309	1-249-433-11	CARBON	22K	5% 1/4W	
R310	1-249-411-11	CARBON	330	5% 1/4W	
R311	1-249-409-11	CARBON	220	5% 1/4W	
R312	1-249-409-11	CARBON	220	5% 1/4W	
R313	1-249-412-11	CARBON	390	5% 1/4W	
		〈 SWITCH 〉			
SW301	1-571-101-12	SWITCH, SLIDE (CHARGE-STANDBY-VTR)			
		〈 OSCILLATOR 〉			
X301	1-577-515-11	VIBRATOR, CERAMIC			
		**********			
	A-4920-393-A	MA BOARD, COMPLETE			
		**********			
	* 1-533-213-31	HOLDER, FUSE			
	* 2-434-681-01	BRACKET (TP-ACC09)			
		〈 CAPACITOR 〉			
C101	⚠ 1-136-472-11	FILM	0.1uF	20% 250V	(US, CND)
C101	⚠ 1-137-109-11	FILM	0.22uF	20% 250V	(AEP, UK, E, AUS)
C102	⚠ 1-161-742-00	CERAMIC	0.0022uF	20% 400V	
C103	⚠ 1-161-742-00	CERAMIC	0.0022uF	20% 400V	
C104	⚠ 1-161-742-00	CERAMIC	0.0022uF	20% 400V	
C105	⚠ 1-161-742-00	CERAMIC	0.0022uF	20% 400V	(AEP, UK, E, AUS)
C106	1-128-319-11	ELECT	47uF	99% 400V	
C107	1-136-203-11	FILM	0.01uF	10% 250V	
C108	1-124-120-11	ELECT	220uF	20% 25V	
C109	1-126-233-11	ELECT	22uF	20% 50V	
C201	1-106-351-00	MYLAR	2200PF	5% 200V	
C202	1-106-351-00	MYLAR	2200PF	5% 200V	

Ref.No.	Par
C203	1-1
C204	1-1
C205	1-1
C206	1-1
C207	1-1
C208	1-1
C209	1-1
C210	1-1
C211	1-1
CN101	1-5
CN201	1-5
CN202	* 1-5
D101	8-7
D102	8-7
D103	8-7
D104	8-7
D105	8-7
D201	8-7
D202	8-7
D203	8-7
D204	8-7
F101	⚠ 1-5
F101	⚠ 1-5
F201	⚠ 1-5
FB101	1-5
IC201	8-7
J201	1-5
J202	1-5
L101	⚠ 1-4
L201	1-4
L202	1-4

Note:
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number spec

SECTION 6
ELECTRICAL PARTS LIST

LD MA

AC-V60A/V65A

MA

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

When including parts by reference number, please include the board name.

Ref.No.	Part No.	Description				Remark
	* A-4925-544-A	LD BOARD, COMPLETE				
		**********				
		⟨ CAPACITOR ⟩				
C301	1-136-165-00	FILM	0.1uF	5%	50V	
C302	1-136-153-00	FILM	0.01uF	5%	50V	
C303	1-126-160-11	ELECT	1uF	20%	50V	
C305	1-136-153-00	FILM	0.01uF	5%	50V	
		⟨ CONNECTOR ⟩				
CN301	1-580-383-11	PIN, CONNECTOR 10P				
		⟨ DIODE ⟩				
D301	8-719-911-19	DIODE 1SS119				
D302	8-719-940-82	DIODE SLR-34MC3 (POWER)				
D303	8-719-946-30	DIODE SLR-34DC3 (CHARGE)				
D304	8-719-110-41	DIODE RD15ES-B2				
D305	8-719-110-41	DIODE RD15ES-B2				
D306	8-719-911-19	DIODE 1SS119				
D307	8-719-911-19	DIODE 1SS119				
D308	8-719-911-19	DIODE 1SS119				(AEP, UK, E, AUS)
D309	8-719-911-19	DIODE 1SS119				
		⟨ IC ⟩				
IC301	8-759-512-82	IC MB88211P-171N				
		⟨ TRANSISTOR ⟩				
Q301	8-729-900-80	TRANSISTOR	DTC114ES			
Q302	8-729-900-61	TRANSISTOR	DTA114ES			
		⟨ RESISTOR ⟩				
R301	1-215-454-00	METAL	24K	1%	1/6W	
R302	1-249-432-11	CARBON	18K	5%	1/4W	
R303	1-249-433-11	CARBON	22K	5%	1/4W	
R304	1-249-414-11	CARBON	560	5%	1/4W	
R305	1-249-429-11	CARBON	10K	5%	1/4W	
R306	1-249-433-11	CARBON	22K	5%	1/4W	
R307	1-249-433-11	CARBON	22K	5%	1/4W	
R308	1-249-434-11	CARBON	27K	5%	1/4W	
R309	1-249-433-11	CARBON	22K	5%	1/4W	
R310	1-249-411-11	CARBON	330	5%	1/4W	
R311	1-249-409-11	CARBON	220	5%	1/4W	
R312	1-249-409-11	CARBON	220	5%	1/4W	
R313	1-249-412-11	CARBON	390	5%	1/4W	
		⟨ SWITCH ⟩				
SW301	1-571-101-12	SWITCH, SLIDE (CHARGE-STANDBY-VTR)				
		⟨ OSCILLATOR ⟩				
X301	1-577-515-11	VIBRATOR, CERAMIC				
		**********				
	A-4920-393-A	MA BOARD, COMPLETE				
		**********				
	* 1-533-213-31	HOLDER, FUSE				
	* 2-434-681-01	BRACKET (TP-ACC09)				
		⟨ CAPACITOR ⟩				
C101	⚠ 1-136-472-11	FILM	0.1uF	20%	250V	(US, CND)
C101	⚠ 1-137-109-11	FILM	0.22uF	20%	250V	(AEP, UK, E, AUS)
C102	⚠ 1-161-742-00	CERAMIC	0.0022uF	20%	400V	
C103	⚠ 1-161-742-00	CERAMIC	0.0022uF	20%	400V	
C104	⚠ 1-161-742-00	CERAMIC	0.0022uF	20%	400V	
C105	⚠ 1-161-742-00	CERAMIC	0.0022uF	20%	400V	(AEP, UK, E, AUS)
C106	1-128-319-11	ELECT	47uF	99%	400V	
C107	1-136-203-11	FILM	0.01uF	10%	250V	
C108	1-124-120-11	ELECT	220uF	20%	25V	
C109	1-126-233-11	ELECT	22uF	20%	50V	
C201	1-106-351-00	MYLAR	2200PF	5%	200V	
C202	1-106-351-00	MYLAR	2200PF	5%	200V	

Ref.No.	Part No.	Description				Remark
C203	1-126-152-11	ELECT	1200uF	20%	16V	
C204	1-126-103-11	ELECT	470uF	20%	16V	
C205	1-126-301-11	ELECT	1uF	20%	50V	
C206	1-136-153-00	FILM	0.01uF	5%	50V	
C207	1-136-165-00	FILM	0.1uF	5%	50V	
C208	1-124-477-11	ELECT	47uF	20%	25V	
C209	1-124-034-51	ELECT	33uF	20%	16V	
C210	1-124-471-00	ELECT	1000uF	20%	6.3V	
C211	1-124-443-00	ELECT	100uF	20%	10V	
		⟨ CONNECTOR ⟩				
CN101	1-564-321-11	CORD, CONNECTOR POWER				(AEP, UK, E, AUS)
CN201	1-569-899-11	CONNECTOR, MUTUAL 10P				
CN202	* 1-564-711-11	PIN, CONNECTOR (SMALL TYPE) 9P				
		⟨ DIODE ⟩				
D101	8-719-941-00	DIODE DF06M				
D102	8-719-948-45	DIODE ERA22-06TP5				
D103	8-719-911-19	DIODE 1SS119				
D104	8-719-948-45	DIODE ERA22-08				
D105	8-719-970-02	DIODE 1SR139-400				
D201	8-719-310-56	DIODE FMB-29L				
D202	8-719-109-85	DIODE RD5.1ES-B2				
D203	8-719-975-85	DIODE ERB83-004				
D204	8-719-911-19	DIODE 1SS119				
		⟨ FUSE ⟩				
F101	⚠ 1-532-285-11	FUSE, TIME-LAG (250V 1.25A)				(AEP, UK, E, AUS)
F101	⚠ 1-532-823-11	FUSE, GLASS TUBE (125V 1.25A)				(US, CND)
F201	⚠ 1-532-604-21	FUSE, TEMPERATURE (130℃)				
		⟨ FERRITE BEAD ⟩				
FB101	1-543-566-11	BEAD, FERRITE				
		⟨ IC ⟩				
IC201	8-759-982-21	IC RC78L05A				
		⟨ JACK ⟩				
J201	1-537-179-11	TERMINAL BOARD (VIDEO OUT-RFU-AUDIO ⟨MONO⟩)				
J202	1-569-586-11	JACK, PIN 2P				(L-AUDIO-R) (AC-V65A)
		⟨ COIL ⟩				
L101	⚠ 1-424-079-11	LFT				
L201	1-421-569-00	COIL, CHOKE 10uH				
L202	1-424-216-11	TRANSFORMER, LINE FILTER				
		⟨ PHOTO COUPLER ⟩				
PH101	8-719-156-86	PHOTO COUPLER PS2501L1-DA				(AC-V65A)
PH101	8-719-971-68	PHOTO COUPLER PC113A				(AC-V60A)
		⟨ TRANSISTOR ⟩				
Q101	8-729-144-97	TRANSISTOR 2SK1758				
Q201	8-729-820-94	TRANSISTOR 2SB1127				
	8-729-820-95	TRANSISTOR 2SB1127-T				
Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q203	8-729-820-94	TRANSISTOR 2SB1127				
Q204	8-729-177-32	TRANSISTOR 2SD773				
Q205	8-729-927-57	TRANSISTOR DTB143ESTP				
Q206	8-729-900-80	TRANSISTOR DTC114ES				
Q207	8-729-142-46	TRANSISTOR 2SC2001TP-L				
		⟨ RESISTOR ⟩				
R101	1-214-947-00	METAL	2.7M	1%	1/2W	
R102	1-202-729-00	SOLID	6.8M	10%	1/2W	(US, CND)
R103	⚠ 1-217-206-11	WIREWOUND	3.3	10%	2W	F
R104	1-249-441-11	CARBON	100K	5%	1/4W	
R105	1-249-441-11	CARBON	100K	5%	1/4W	
R106	1-249-441-11	CARBON	100K	5%	1/4W	
R107	⚠ 1-215-902-11	METAL OXIDE	47K	5%	2W	F
R108	⚠ 1-212-934-00	FUSIBLE	1	5%	1/2W	F
R109	⚠ 1-216-345-11	METAL	0.47	5%	1W	F
R110	1-249-441-11	CARBON	100K	5%	1/4W	
R111	1-249-410-11	CARBON	270	5%	1/4W	
R112	1-249-393-11	CARBON	10	5%	1/4W	
R113	1-249-389-11	CARBON	4.7	5%	1/4W	
R114	1-249-440-11	CARBON	82K	5%	1/4W	
R115	1-249-440-11	CARBON	82K	5%	1/4W	
R116	1-249-440-11	CARBON	82K	5%	1/4W	
R201	⚠ 1-249-451-11	CARBON	2.2	5%	1/4W	F
R202	⚠ 1-218-191-11	METAL	0.1	5%	1W	F
R203	1-249-429-11	CARBON	10K	5%	1/4W	
R204	⚠ 1-215-864-00	METAL OXIDE	150	5%	1W	F
R205	1-249-429-11	CARBON	10K	5%	1/4W	
R206	1-249-421-11	CARBON	2.2K	5%	1/4W	
R207	1-249-429-11	CARBON	10K	5%	1/4W	
R208	1-249-429-11	CARBON	10K	5%	1/4W	
R209	1-249-407-11	CARBON	150	5%	1/4W	
R210	⚠ 1-215-863-11	METAL OXIDE	100	5%	1W	F
R211	1-249-417-11	CARBON	1K	5%	1/4W	
R212	1-249-412-11	CARBON	390	5%	1/4W	
R213	1-249-415-11	CARBON	680	5%	1/4W	

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le neméro spécifié.

Ref. No.	Part No.	Description			Remark
R214	1-247-821-11	CARBON	390	5% 1/4W	(US, CND)
R214	1-249-417-11	CARBON	1K	5% 1/4W	(AEP, UK, E, AUS)
R215 ⚠	1-212-857-61	CARBON	10	5% 1/4W F	(AC-V65A: AEP, UK, AUS, E)
R215 ⚠	1-247-688-11	CARBON	10	5% 1/4W F	(AC-V60A) (AC-V65A: US, CND)
R216	1-249-424-11	CARBON	3.9K	5% 1/4W	
R217	1-249-425-11	CARBON	4.7K	5% 1/4W	
R218	1-249-409-11	CARBON	220	5% 1/4W	
R219	1-215-392-00	METAL	62	1% 1/6W	
		〈 VARIABLE RESISTOR 〉			
RV201	1-228-993-00	RES, ADJ, METAL 4.7K			
RV202	1-228-989-00	RES, ADJ, METAL 470			

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CC BOARD, COMPLETE
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〈 CAPACITOR 〉

C051	1-135-091-00	TANTALUM CHIP	1uF	20% 16V	
C052	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
		〈 DIODE 〉			
D051	8-719-104-34	DIODE 1S2835-T1			
		〈 IC 〉			
IC051	8-759-100-94	IC uPC358G2			
		〈 TRANSISTOR 〉			
Q051	8-729-923-80	TRANSISTOR DTC143EK			
		〈 RESISTOR 〉			
R051	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R052	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R053	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R054	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R055	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R056	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R057	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R058	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R059	1-216-039-00	METAL CHIP	390	5% 1/10W	
R060	1-216-025-00	METAL CHIP	100	5% 1/10W	
R061	1-216-097-00	METAL CHIP	100K	5% 1/10W	
R062	1-216-295-00	METAL CHIP	0	5% 1/10W	
R063	1-216-295-00	METAL CHIP	0	5% 1/10W	

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Ref. No.	Part No.	Description			Remark
		CT BOARD, COMPLETE			
		**********			
		〈 CAPACITOR 〉			
C010	1-164-182-11	CERAMIC CHIP	0.0033uF	10% 50V	
C011	1-163-263-11	CERAMIC CHIP	330PF	5% 50V	
C012	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C013	1-135-179-21	TANTAL. CHIP	2.2uF	20% 16V	
C014	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C015	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
		〈 DIODE 〉			
D010	8-719-107-44	DIODE RD24M-T1B3			
		〈 IC 〉			
IC010	8-759-323-03	IC HA16107FR			
		〈 RESISTOR 〉			
R011	1-216-016-11	METAL GLAZE	43	5% 1/10W	
R012	1-216-015-00	METAL CHIP	39	5% 1/10W	
R013	1-216-083-00	METAL CHIP	27K	5% 1/10W	
R014	1-216-083-00	METAL CHIP	27K	5% 1/10W	
R015	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R016	1-216-295-00	METAL CHIP	0	5% 1/10W	
R017	1-216-295-00	METAL CHIP	0	5% 1/10W	

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ACCESSORY & PACKING MATERIAL
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	1-566-703-11 ADAPTOR, CONVERSION	(US)
	3-753-034-21 MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH)	(US, CND)
	1-569-008-11 ADAPTOR, CONVERSION	(E)
	3-753-034-11 MANUAL, INSTRUCTION (AC-V65A: AEP, UK, E, AUS) (ENGLISH, FRENCH, GERMAN, SPANISH, DUTCH, SWEDISH, ITALIAN, ARABIC)	
	3-753-032-11 MANUAL, INSTRUCTION (AC-V60A: AEP, UK, E, AUS) (ENGLISH, FRENCH, GERMAN, SPANISH, DUTCH, SWEDISH, ITALIAN, ARABIC)	

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HARDWARE LIST

#1	2-434-625-01	SCREW (P2.6X27)
#2	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S
#3	7-628-254-20	SCREW +PS 2.6X8
#4	7-621-773-95	SCREW +B 2.6X6

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

SECTION 7
ELECTRICAL ADJUSTMENTS

- First of all, remove the MA Board from the LS Board, and make the following adjustment:

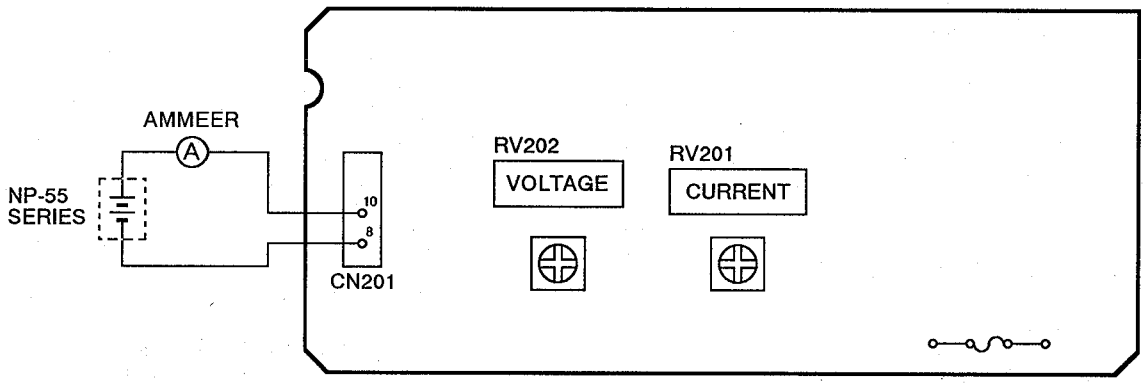
1. Adjusting VTR output voltage

1) Short-circuit pins ② amd ⑤ of CN201 with a wire. (VTR mode)
2) Turn the power of the MA Board ON. (Plug the power cord in a receptacle.)
3) Adjust RV202 so that the output voltage of the connection cord is in the limits of 7.7 ± 0.05 V.
4) Remove the short-circuit wire from pins ② and ⑤.

2. Adjusting output current

1) Short-circuit pins ② and ④, and pins ② and ⑥, respectively with a wire. (Charge mode)
2) Connect an ammeter (3 A class) and batteries (NP series such as NP-55, or other batteries of 6 to 7 V open terminal voltage) to pins ⑧ and ⑩ of CN201.
3) Turn the power of the MA Board ON. (Plug the power cord in a receptacle.)
4) Adjust RV201 so that the charging current is in the limits of 1.2 ± 0.05 A.
5) Disconnect the ammeter and batteries from pins ⑧ and ⑩ of CN201.
   Then remove the short-circuit wires from pins ② and ④ and pins ② and ⑥ of CN201.

MA Borad (Component side)



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